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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/429,986	10/29/1999	YUJI YAMADA	7217/60017	6609

7590

06/07/2004

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EXAMINER
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PENDLETON, BRIAN T

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/429,986

Applicant(s)

YAMADA, YUJI

Examiner

Brian T. Pendleton

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

DETAILED ACTION

*Response to Arguments*

1. Applicant's arguments with respect to claims 1 and 3-7 have been considered but are moot in view of the new ground(s) of rejection.

*Claim Rejections - 35 USC § 103*

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connor et al in view of Matsuo in further view of Yamada. Connor et al disclose a sound processing apparatus in figure 4 comprising left FIR filter 52, right FIR filter 56, left reverb processor 54 and right reverb processor 58 which reads on a first filter means for processing n-channel audio signals in accordance with predetermined finite impulse response characteristics and for converting the n-channel audio signals supplied from at least one signal source into a first channel signal and a second channel signal wherein the FIR filters 52 and 56 represent the first filter means with convert a one-channel signal into a first and second channel signal. Figure 4 also discloses processors 54 and 58 with represent a pair of second filter means for receiving the first and second channel signals output from the first filter means. As illustrated in the figure, the first and second channel signals are separate and unmixed. Connor et al do not explicitly state that the signal processing in the pair of second filters 54 and 58 is digital, uncorrelated and having different delay times. Matsuo discloses a three-dimensional sound processing system. In the description of related art, column 2 line 66 – column 3 line 4, Matsuo discloses that conventional sound processing systems used FIR filters to impart reverberation. It was well

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known that FIR filters (like that shown in figure 16) comprise delay times corresponding to predetermined transfer functions relating to reflective sound components. The FIRs comprise multipliers and an adder for adding each multiplier output. FIR implementation was easy and reliable. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the Connor et al invention by including FIR filters in the left and right reverb processors 54 and 56 for the purpose of creating reverberation effects. One of ordinary skill in the art would have known that the reverberation characteristics for the different output signals (ears) would necessitate different delay times. The combination of Connor et al and Matsuo does not state that the output unit is a headphone, however, per the teachings of Yamada, it was well known to use headphones as the output units for stereophonic signals with the simple adjustment of the filter coefficients to generate "out of the head" signals. Claims 1 and 3 are met. Regarding claim 4, it was obvious to having equivalent transfer characteristics for digital filters 52 and 56 for generating sound images symmetrical about an axis.

4. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connor et al in view of Matsuo in further view of Yamada in further view of Inanaga et al. The combination of Connor et al, Matsuo and Yamada teaches an apparatus having a first filter means, second filter means and a headphone. The combination does not teach that the headphone has detection means for detecting rotational movement of the listener's head and varying the transfer functions of the second filter means in response to the movement. However, that feature was taught and suggested by Inanaga et al. It was advantageous to have a vibratory gyroscope in a headphone system for the purpose of changing a filter's characteristics since under normal listening conditions without headphones, a listener's experience will change with the rotation of his/her

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head. Therefore, the use of the gyroscope added more realism to the listening experience. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of invention to use the teaching of Inanaga et al in the invention described by the combination of Connor et al, Matsuo and Yamada. The modified combination would include a gyroscope 30 (having piezoelectric pieces, per claim 6) whose output, which detects head angle, coupled to the FIRs of the second filter means in Connor et al. Per claim 7, Yamada et al teach a headphone system having such a geomagnetic azimuth sensor and changing the delay times of circuit elements 30 according to head movement. For the same reasons above, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Connor et al to have a geomagnetic azimuth sensor for the purpose of changing delay times of the second filter means in response to head turning.

### *Conclusion*

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

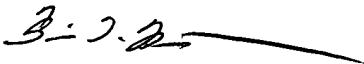
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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

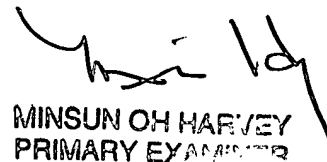
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



btp



MINSUN OH HARVEY  
PRIMARY EXAMINER